



A STUDY ON THE PSYCHOLOGICAL IMPACT ON TREATMENT BURDEN IN ANAEMIC CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING HAEMODIALYSIS

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ABSTRACT

Backgrounds: Chronic kidney disease (CKD) is one of the major non-communicable diseases that is linked to high economic and health burdens globally. Anemia is an inevitable and common complication of CKD. **Objectives:** The objective of the study was to investigate the psychological impact on the treatment burden in anemia patients undergoing hemodialysis in association with gender, age, disease duration, and co-morbidity. **Methods:** A total of 50 anemic patients undergoing hemodialysis, aged 30-70 years based on inclusion and exclusion criteria were considered from different hospitals situated in and around district Ropar, Punjab. A treatment burden questionnaire (TBQ) was used to assess the treatment-related burden in study participants. Health-related quality of life was assessed through a validated KDQOL-36TM questionnaire. **Results:** The results revealed a high prevalence of anemia, which increased as renal function declined and was more severe in dialysis patients. A large proportion of patients reported low to moderate treatment burden, and dialysis patients experienced a higher burden than CKD patients. A strong negative correlation was observed between treatment burden and health-related quality of life. **Conclusion:** It might be concluded from the present study that the treatment burden should be minimized through CKD management strategies.

KEYWORDS: Psychological Impact. Treatment Burden. Anemia Patients. Hemodialysis.

INTRODUCTION

Chronic kidney disease (CKD) is one of the major non-communicable diseases that is linked to high economic and health burdens globally. The global prevalence of CKD is 13.4%, with approximately 4.9–7.1 million patients with end-stage renal disease (ESRD) requiring renal replacement therapy.^[1] CKD is becoming a global health issue, as the occurrence and spread of ESRD have increased continuously during the past three decades.

Anemia is an inevitable and common complication of CKD.^[2] The World Health Organization (WHO) defines anemia as 'hemoglobin concentration <13 g/dl in men and <12 g/dl in women of childbearing age'.^[3] CKD patients are twice as likely to experience anemia as compared to those without renal disease, and the rate of anemia tends to increase as the estimated glomerular filtration rate (eGFR) decreases.^[4] There is an exponential relationship between reduced glomerular

filtration and anemia. Anemia typically develops when the GFR is reduced to 0.5 mL/s or 0.75 mL/s in patients with diabetic nephropathy.^[5] It was reported that 80.5% of patients with CKD are affected by anemia.^[4] A study from South Ethiopia has shown high anemia incidence, and the intensity of the disease has increased with advanced stages of CKD and in dialysis patients.^[6]

The mechanisms of anemia associated with CKD are multifactorial. Gradual decline in endogenous erythropoietin (EPO) level plays a substantial role in anemia development.^[7] The other factors are an absolute iron deficiency results from blood loss or decreased iron absorption, an under-utilization of iron stores caused by high hepcidin levels, a low bone marrow response to EPO, a shortened RBC life span, systemic inflammation caused by CKD and related co-morbid conditions and vitamin B12 or folic acid shortage.^[8] The early detection and appropriate treatment of anemia can reduce

cardiovascular co-morbidities, improve patients' overall quality of life (QoL) and reduce the mortality rate.^[9,10]

Treatment burden is an emerging concept in chronic disease management.^[11] Treatment burden is 'the workload imposed by healthcare on patients and the effect this has on quality of life (QoL)'.^[12] The burden of treatment is focused on unpleasant feelings associated with receiving treatment. The burden of care may vary based on the kind of treatment a person gets.^[13] Many studies have shown that burden is linked to poor adherence to treatment, adverse clinical outcomes, poor satisfaction of patient with care, gender,^[14] reduced QoL and a high rate of hospitalization and fatality.^[15] CKD is associated with multiple co-morbidities and complications that often lead to polypharmacy and require complex regimens of self-care, other healthcare interventions and actions that pose significant treatment burdens.^[16]

Limited data on anemia management and treatment burden, in male and female patients undergoing hemodialysis is available,^[17,18] especially in resource-constrained regions like Punjab. Therefore, to fulfill the lacunae of knowledge, in the present study an attempt has been made to investigate the psychological impact on the treatment burden in anemia patients undergoing hemodialysis in association with gender, age, disease duration, and co-morbidity.

MATERIALS AND METHODS

Samples

The present study was a hospital-based, cross-sectional, analytical study. A total of purposively selected 50 anemic patients undergoing hemodialysis aged 30-70 years were selected from Dasmesh Healthcare & Hospital, Rupnagar, Punjab, India, through G-power software. The inclusion criteria of this study were: patients aged 30 to 70 years of age, undergoing maintenance haemodialysis treatment for at least six months, CKD stage III- V dialysis patients, anaemic patients undergoing MHD and clinically stable patients. The exclusion criteria for the subjects were: patients with acute kidney injury (AKI), patients with age below 30 years and above 70 years, recent blood transfusions (within the last six months) and patients who has undergone renal transplantation. Prior to the study, the purpose of the study was explained to all the subjects, also a written consent was taken. The study was approved by Institutional Ethical Committee.

METHODOLOGY

The patients were interviewed when they were comfortable and only after the dialysis procedure was over. A specially designed proforma was used to document background details and sociodemographic profile, clinical examination, and investigation findings. Psychiatric comorbidity was assessed by administering Schedules for Clinical Assessment in Neuropsychiatry (SCAN). The psychiatric diagnoses were based on the

International Classification of Disease-10 (ICD-10) Diagnostic criteria for Research (DCR). Hamilton Depression Scale (HAM-D) was used to assess depression and its severity. A treatment burden questionnaire (TBQ) was used to assess the treatment-related burden in the patients.

Statistical analysis

Standard descriptive statistics (percentages) were analyzed for the variables of the subjects using SPSS (Statistical Package for Social Science) version 21.0 (IBM, USA). Parametric data were analyzed using paired and unpaired *t*-test. Chi-square test was applied to search the association between psychological illness and treatment burden in anemic patients undergoing hemodialysis. To indicate statistical significance, 5% level of probability was used.

RESULTS

Table 1 showed the gender-wise distribution of the patients undergoing hemodialysis. The patients were predominantly males (70.00%) as compared to their female counterparts (30.00%).

The demographic characteristics of age and education in the chronic kidney disease anemic patients undergoing dialysis were exhibited in Table 2. The maximum percentage (56.00%) of age-group in patients fall between 41-60 years, followed by 21-40 years (26.00%), ≤ 20 years (10.00%) and the least (8.00%) in the age group > 60 years. The maximum patients (42.00%) were recorded as illiterate, followed by secondary (18.00%), higher secondary (16.00%), primary (14.00%) and the list in graduate category (10.00%).

Table 3 showed demographic characteristics of occupation, marital status and monthly income in the patients. The maximum patients (72.00%) were unemployed, followed by homemaker (12.00%), students (8.00%), unskilled (4.00%), and the self-employed and skilled the least (2.00% each). So far marital status is concerned, the maximum patients (60.00%) were married, followed by unmarried (40.00%). The maximum patients (48.00%) were in the monthly income group of Rs. 5001-10000, followed by Rs. 10,000-15,000 (26.00%), Rs. <5000 (16.00%), and the least in the category of Rs. 15,000-20,000 (10.00%).

The demographic characteristics of comorbid physical disorders, psychiatric comorbidity and duration of chronic kidney disease in the patients were demonstrated in Table 4. In comorbid physical disorders, the maximum patients (52.00%) were with diabetes mellitus, followed by hypertension (42.00%), thyroid disorders (8.00%), mixed anxiety and depression. (4.00%) and the least in the mental and behavioral disorders due to harmful use of alcohol the least (2.00%). In psychiatric comorbidity, the maximum patients (46.00%) were with adjustment disorder, followed by depression (40.00%) and generalized anxiety disorder (6.00%). For the duration of

chronic kidney disease, the maximum duration (46.00%) (34.00%) and >15 the least (20.00%). were recorded between 0-5 months, followed by 6-10

Table 1: Gender-wise distribution of the anemic CKD patients undergoing hemodialysis.

Patients	Absolute No.	Percentage
Male	35	70.00
Female	15	30.00
Total	50	100.00

Table 2: Demographic characteristics of Age and Education in the anemic CKD patients undergoing hemodialysis.

Characteristics	Number of cases (%)
Age (Years)	
≤20	5 (10.00)
21-40	13 (26.00)
41-60	28 (56.00)
>60	4 (8.00)
Education	
Illiterate	21 (42.00)
Primary	7 (14.00)
Secondary	9 (18.00)
Higher secondary	8 (16.00)
Graduate	5 (10.00)

Table 5 showed the demographic characteristics of duration of dialysis, frequency of dialysis and funding for treatment in the anemic CKD patients undergoing hemodialysis. For the duration of dialysis, the maximum patients 50.00%) conducted the dialysis for more than 3 months, followed by 1-3 months (30.00%) and the duration <1 month, the least (20.00%). For the frequency of dialysis, the maximum patients (66.00%) conducted

the dialysis thrice a week, followed by twice a week (34.00%). In funding for treatment, 100% patients were of non-sponsored.

The Hamilton Depression Scale scores of anemic CKD patients undergoing hemodialysis were exhibited in Table 6. A total of 23 patients (46.00%) were recorded with psychiatric disorder.

Table 3: Demographic characteristics of occupation, Marital Status and Monthly income in the chronic kidney disease patients undergoing dialysis.

Characteristic	Number of cases (%)
Occupation	
Homemaker	6 (12.00)
Student	4 (8.00)
Self-employed	1 (2.00)
Skilled	1 (2.00)
Unskilled	2 (4.00)
Unemployed	36 (72.00)
Marital status	
Married	30 (60.00)
Unmarried	20 (40.00)
Monthly income (Rs)	
<5000	8 (16.00)
5001-10,000	24 (48.00)
10,001-15,000	13 (26.00)
15,000-20,000	5 (10.00)

Table 7 highlighted the association between treatment burden in CKD and psychiatric illness. the maximum patients (60.87%) were with high burden, followed by moderate burden (26.09%) and the least (13.04%) with low burden. However, highly significant association ($p < 0.001$) was found between treatment burden and psychiatric disorder in patients.

Table 4: Demographic characteristics of comorbid physical disorders, psychiatric Comorbidity and Duration of chronic kidney disease in the chronic kidney disease patients undergoing dialysis.

Characteristic	Number of cases (%)
Comorbid physical disorders	
Hypertension	20 (40.00)
Diabetes mellitus	26 (52.00)
Thyroid disorders	4 (8.00)
Psychiatric comorbidity	
Depression+	21 (42.00)
Adjustment disorder	23 (46.00)
Generalized anxiety disorder	3 (6.00)
Mixed anxiety and depression	2 (4.00)
Mental and behavioral disorders due to harmful use of alcohol	1 (2.00)
Duration of chronic kidney disease (months)	
0-5	23 (46.00)
6-10	17 (34.00)
>15	10 (20.00)

Table 5: Demographic characteristics of duration of dialysis, frequency of dialysis and funding for treatment in the chronic kidney disease patients undergoing dialysis.

Characteristic	Number of cases (%)
Duration of dialysis (months)	
<1	10 (20.00)
1-3	15 (30.00)
>3	25 (50.00)
Frequency of dialysis (per week)	
Two	17 (34.00)
Three	33 (66.00)
Funding for treatment	
Sponsored	0 (0.00)
Non-sponsored	50 (100.00)

Table 6: Hamilton Depression Scale scores of chronic kidney disease patients (n=49) undergoing dialysis.

HAM-D	Total CKD patients, n (%)	With psychiatric disorder, n (%)	No psychiatric disorder, n (%)
0-7 (normal)	25 (50.00)	3 (13.04)	27 (100.00)
8-13 (mild)	16 (32.00)	13 (56.52)	0
-18 (moderate)	6 (12.00)	5 (21.74)	0
19-22 (severe)	2 (4.00)	1 (4.35)	0
22 (very severe)	1 (2.00)	1 (4.35)	0
Total	40 (100.00)	23 (100.00)	27 (100.00)

Table 7: Association between Treatment Burden in CKD and psychiatric illness (n = 50).

Variable	PIP	PIA	χ^2	P
TBQ categories N (%)				
Low burden	3 (13.04)	16 (59.26)		
Moderate burden	6 (26.09)	9 (33.33)	13.921	0.001 (HS)
High burden	14 (60.87)	2 (7.41)		

PIP = Psychiatric illness Present; PIA = Psychiatric illness Absent

The association between sex, education and occupation with psychiatric illness in anemic CKD patients undergoing hemodialysis were shown Table 8. Statistically no significant association ($p>0.05$) was found between psychiatric illness and gender. Whereas highly significant association ($p<0.001$) was found between psychiatric illness and education. Further,

statistically significant association ($p<0.05$) was found between psychiatric illness and occupation.

Table 8: Association between sex, education and occupation with psychiatric illness in chronic kidney disease patients undergoing hemodialysis.

Variables	Psychiatric illness		Total, n (%)	χ^2	P
	Present, n (%)	Absent, n (%)			
Sex					
Male	17 (48.57)	18 (51.43)	35 (70.00)	0.464	0.100 (NS)
Female	6 (40.00)	9 (60.00)	15 (30.0)		
Education					
Illiterate	4 (19.05)	17 (80.95)	21 (42.00)	10.192	0.001 (HS)
Educated	20 (68.96)	9 (31.03)	29 (58.00)		
Occupation					
Employed	9 (64.28)	4 (35.71)	14 (27.50)	3.849	0.05 (S)

DISCUSSION

The primary objective of the study was to investigate the psychological impact on the treatment burden in anemic CKD patients undergoing hemodialysis in association with gender, age, disease duration, and co-morbidity. The concept of treatment burden starts to gain greater attention in the past few years. The findings of the study have been divided into the sociodemographic profile of the patients, their psychological illness details and its association with treatment burden.

Sociodemographic profile

Gender-wise distribution showed that males were more likely to suffer from CKD than females (Table 1). This is in agreement with the findings of an earlier Indian study.^[19] Age-wise distribution showed that 90.0% of patients were <60 years of age and 36.0% were <40 years (Table 2). The reason for the progression of renal failure might be the delay in detecting the renal disease, late referral, and failure to introduce preventive measures.^[19] The literacy rate of the study group (58%) was lower than the literacy rate of the country (74%) (Table 2). This could be explained by the fact that the hospital caters to the low-income rural population who had a lower literacy rate than the general population. The high levels of unemployment (72.0%) of anemic CKD patients on haemodialysis (Table 3) reflected the tremendous stress and strain that the CKD patients are undergoing. Majority of the study sample (60.0%) were married (Table 3). This might be due to the fact that the age range of the sample was >21 years. In India, 95% of women are married by age 25, whereas the same percentage of men are married by the age of 32. Even in comparison with other developing countries, India has one of the lowest ages at marriage.^[20]

Illness details in anemic CKD patients undergoing hemodialysis

Analysis of duration of CKD showed that almost 80% of the participants in our study had been diagnosed with CKD for no later than 15 months with 20.0% is diagnosed <5 months ago, and only 20.4% of patients had CKD for more than 15 months (Table 4). Duration of dialysis-wise distribution showed that 50.0% cases having >3-month duration of dialysis and 30.0% cases having 1–3 months while 20.0% cases having <1-month duration of dialysis. Comorbidity-wise distribution

showed that around 92% of the patients in the study group had hypertension and have diabetes mellitus. Since diabetes and hypertension are the major contributing factor of renal failure that has to be managed properly in its initial stage itself. The lifelong treatment of renal failure along with diabetes and hypertension significantly increases the burden on patients and decreases the outcome also.^[19]

Frequency of dialysis per week-wise (Table 5) distribution showed that 66.0% of the patients underwent dialysis three times per week, this was because most of the cases had started dialysis fairly recently and early; hence, the frequency of dialysis was more. Treatment expenses-wise (Table 5) distribution showed that 100.0% cases showed treatment had self-treatment expenses.

HAM-D-wise (Table 6) distribution showed that 44% of the cases in the study group were diagnosed with some degree of depression. This finding was similar to earlier studies that showed 30% to 40% prevalence of depression in CKD patients undergoing hemodialysis.^[21]

CKD in general and ESRD in particular, contribute to a high economic burden on the health care system worldwide. In the present study, 60.87% patients were of high burden category (Table 7) showing highly significant association between the treatment burden and the psychological illness in the patients. According to the United States Renal Data System, 7.1% of the Medicare cost was attributed only to ESRD patients; \$33.9 billion was contributed to Medicare-associated costs in 2015.^[22] The concept of treatment burden starts to gain greater attention in the past few years. Despite previous attempts toward clarifying the concept of treatment burden, the principle of measuring it is not well-established. A recent systematic review highlighted that there was a significant variation in the process of how treatment-related burden is being measured.^[23]

When the association of psychiatric illness with sex, education and occupation with in chronic kidney disease patients undergoing hemodialysis (Table 8) were studied, it was found that, there were highly significant association ($p < 0.001$) with education and statistically significant association ($p < 0.05$) with occupation.

CONCLUSION

From the findings of the present study, it might be concluded that psychiatric comorbidity was significantly higher in anemic CKD patients undergoing hemodialysis. Psychiatric comorbidity was more common in males in the age group of 41–60 years. The most common psychiatric comorbidity in anemic CKD patients undergoing hemodialysis was adjustment disorder, followed by depression. Patients with recent-onset dialysis are significantly more prone to develop psychiatric disorders. High impact of psychological complication on treatment burden was established in patients with anemia undergoing Hemodialysis.

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Conflicts of interest

There are no conflicts of interest.

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